AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1-26. (canceled)

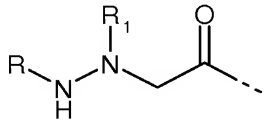
27. (new) A method for the prevention or for the treatment of

- pathologies associated with the presence, in the body of an individual, of an exogenous or endogenous protein capable of being directly or indirectly involved in the process of appearance and/or development of these pathologies, or
- pathologies involving the molecules of the major histocompatibility complex and/or the T cell receptors,
- pathologies associated with the presence in the body of an individual of an antibody capable of being recognized by a hybrid peptide,

or for the *in vitro* diagnosis of the pathologies

comprising the administration of a pharmaceutically acceptable amount of hybrid peptides analogues of peptides or parent proteins, these hybrid peptides containing at least one aza-^{3} aminoacyl residue, namely :

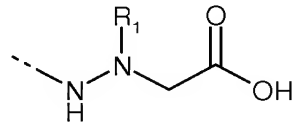
* a residue corresponding to the following formula (A) when it is situated in the N-terminal position,



(A)

wherein R represents H or a protective group of the amine function of the amino acids, such as Fmoc, Boc, or Z, and R_1 represents a side-chain selected from those of the amino acids,

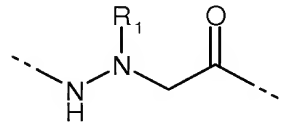
* a residue corresponding to the following formula (B) when it is situated in the C-terminal position,



(B)

wherein R_1 represents a side-chain selected from those of the amino acids,

* a residue corresponding to the following formula (C) when it is situated in the chain of the hybrid peptides,



(C)

wherein R_1 represents a side-chain selected from those of the amino acids.

28. (new) The method according to claim 27, for the prevention or for the treatment of pathologies of viral or bacterial origin, or of autoimmune pathologies, or of neurodegenerative diseases.

29. (new) The method according to claim 27, for the prevention or for the treatment of the following pathologies:

- pathologies involving molecules of the major histocompatibility complex and/or the T cell receptors,
- autoimmune diseases, and in particular Hashimoto thyroiditis, Basedow's disease, Addison's disease, pituitary insufficiency, Biermer's gastritis, certain forms of

sterility, type 1 juvenile diabetes, Goodpasture's syndrome, myasthenia, acute articular rheumatism, pemphigus, bullous pemphigoid, herpetiform dermatitis, vitiligo, alopecia, psoriasis, sympathetic ophthalmia, uveitis, Guillain-Baré's syndrome, multiple sclerosis, haemolytic anaemia, idiopathic thrombocytopaenic purpura, idiopathic leucopaenia, primary biliary cirrhosis, active chronic hepatitis, ulcerative colitis, Crohn's ileitis, Gougerot-Sjögren syndrome, rheumatoid polyarthritis, dermatopolymyositis, scleroderma, mixed connective tissue disease, discoid lupus erythematosus and systemic lupus erythematosus,

- neurodegenerative diseases,
- diseases of viral origin, in particular:

– AIDS caused by human immunodeficiency virus HIV-1 and HIV-2,

– paraplegia associated with HTVL-1, or adult T cell leukaemia, caused by human T cell leukaemia virus (HTLV virus),

– infections caused by the syncytial respiratory virus,

– infections caused by the Coxsackie virus, for example acute lymphocytic meningitis,

– infections caused by the Epstein-Barr virus, for example infectious mononucleosis,

– infections caused by the cytomegalovirus, for example cytomegalic inclusion disease,

– herpes caused by the human herpes virus,

– herpes caused by the herpes simplex virus 6,

– infections caused by the human parvovirus B19, for example infectious gastroenteritis,

– hepatitis B caused by the hepatitis B virus,

– hepatitis C caused by the hepatitis C virus,

– influenza caused by the influenza virus,

– rubella caused by the rubella virus,

- infections caused by the Dengue virus, for example the arboviroses,
- colds, rhinitis and coryza caused by the rhinoviruses,
- aphthous fever caused by aphthous fever virus,
- certain cancers linked with viruses, such as the papilloma viruses.

30. (new) The method according to claim 27, comprising the administration of a pharmaceutically acceptable amount of hybrid peptides of the following formula (I) :

(I) aa_l- N haa_m-aa_n- N haa_o-aa_p

wherein :

- aa_l, aa_n and aa_p represent an aminoacyl residue, or a concatenation of aminoacyl residues, corresponding to the aminoacyl residues present at the same positions in the peptide or the parent protein from which the hybrid peptides are derived,
- N haa_m and N haa_o represent an aza-β^3 aminoacyl monomer residue, or a concatenation of aza-β^3 aminoacyl monomer residues analogous to the aminoacyl residues initially present at the same position in the peptide or the parent protein from which the hybrid peptides are derived, the aza-β^3 aminoacyl monomers corresponding to the formulae (A), (B), or (C), depending on whether they are respectively in the N-terminal or C-terminal position, or in the chain of the hybrid peptides, and wherein R_1 is identical to the side-chain of the initial amino acid of the peptide or of the parent protein to which the aza-β^3 aminoacyl monomers correspond,
- l, m, n, o, and p represent zero, or a whole number lying between 1 and 20, provided that at least one of m or o is different from zero, and that the minimum number of residues in the hybrid peptides of formula (I) is 4.

31. (new) The method according to claim 27, for the prevention or for the treatment of systemic lupus erythematosus, comprising the administration of a pharmaceutically acceptable amount of hybrid peptides derived from the epitope 88-99 of the histone H4 as parent peptide, and corresponding to SEQ ID NO: 1, at least one of whose initial amino acids is replaced by an aza-β^3 amino acid analogue residue.

32. (new) The method according to claim 27, for the prevention or for the treatment of systemic lupus erythematosus, comprising the administration of a pharmaceutically acceptable amount of hybrid peptides of the following formulae:

- SEQ ID NO: 2 (or peptide E):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-Tyr-Gly-OH^{99}

- SEQ ID NO: 3 (or peptide C):

$^{88}H_2N$-Tyr-Ala-N -hLeu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 4 (or peptide A):

$^{88}H_2N$-Tyr-N -hAla-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 5 (or peptide B):

$^{88}H_2N$-Tyr-N -hAla-N -hLeu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 6 (or peptide D):

$^{88}H_2N$-Tyr-Ala-Leu-N -hLys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 7 (or peptide G):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-N -hTyr-Gly-OH^{99}

- SEQ ID NO: 8:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-N -hGly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 9:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-N -hArg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 10:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-N -hArg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 11:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-N -hTyr-Gly-OH^{99}

- SEQ ID NO: 12:

$^{88}H_2N$-N -hTyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 13:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-N -hGly-OH^{99}

- SEQ ID NO: 14:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-N -hTyr-N -hGly-OH^{99}

33. (new) The method according to claim 27, for the prevention or for the treatment of systemic lupus erythematosus, comprising the administration of a pharmaceutically acceptable amount of the hybrid peptide of formula SEQ ID NO: 2, or of the hybrid peptide of formula SEQ ID NO: 7.

34. (new) The method according to claim 27, for the prevention or for the treatment of influenza or of any other pathology for which a molecule containing a B or CTL (CD8) epitope is administered in combination with the sequence 307-319 HA which contains a so-called universal T CD4 epitope

comprising the administration of a pharmaceutically acceptable amount of hybrid peptides derived from the peptide 307-319 of the haemagglutinin of the influenza virus as parent peptide, and corresponding to SEQ ID NO: 15, at least one of whose initial amino acids is replaced by an aza-β^3 amino acid analogue residue.

35. (new) The method according to claim 27, for the prevention or for the treatment of influenza or of any other pathology for which a molecule containing a B or CTL (CD8) epitope is administered in combination with the sequence 307-319 HA which contains a so-called universal T CD4 epitope

comprising the administration of a pharmaceutically acceptable amount of hybrid peptides of the following formulae:

- SEQ ID NO: 16 (or peptide A'):

$^{307}H_2N$-N -hPro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 17 (or peptide B'):

$^{307}H_2N$-Pro-N -hLys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 18 (or peptide C'):

$^{307}H_2N$-Pro-Lys-N -hTyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 19 (or peptide D'):

$^{307}H_2N$-Pro-Lys-Tyr-N -hVal-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 20 (or peptide E'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-N -hLys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 21 (or peptide F'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-N -hLeu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 22 (or peptide G'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-N -hLys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 23 (or peptide H'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-N -hAsn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 24 (or peptide I'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-N -hLeu-Ala-Thr-OH^{319}

- SEQ ID NO: 25 (or peptide J'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-N -hAla-Thr-OH^{319}

- SEQ ID NO: 26 (or peptide K'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-N -hLys-N -hLeu-N -hAla-Thr-OH^{319}

- SEQ ID NO: 27 (or peptide L'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-N -hLeu-N -hAla-Thr-OH^{319}

36. (new) The method according to claim 27, for the prevention or for the treatment of influenza or of any other pathology for which a molecule containing a B or CTL (CD8) epitope is administered in combination with the sequence 307-319 HA which contains a so-called universal T CD4 epitope

comprising the administration of a pharmaceutically acceptable amount of the hybrid peptide of formula SEQ ID NO: 25.

37. (new) Hybrid peptides containing at least one aza-β^3 amino acid, these hybrid peptides being analogues of peptides or parent proteins, the hybrid peptides containing at least one initial amino acid of the peptide or of the parent protein.

38. (new) Hybrid peptides according to claim 37, of the following formula (I):

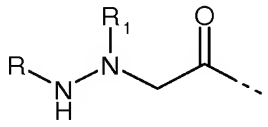
(I) aa_1–N haa_m–aa_n–N haa_o–aa_p

wherein:

– aa_1, aa_n and aa_p represent an aminoacyl residue, or a concatenation of aminoacyl residues, corresponding to the aminoacyl residues present at the same positions in the peptide or the parent protein from which the hybrid peptides are derived,

– N haa_m and N haa_o represent an aza-β^3 aminoacyl monomer residue, or a concatenation of aza-β^3 aminoacyl monomer residues, analogous to the aminoacyl residues initially present at the same position in the peptide or the parent protein from which the hybrid peptides are derived, the aza-β^3 aminoacyl monomers corresponding to

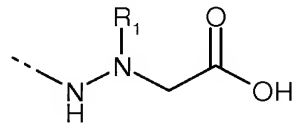
* the following formula (A) when it is situated in the N-terminal position,



(A)

wherein R represents H or a protective group of the amine function of the amino acids, such as Fmoc, Boc, or Z, or

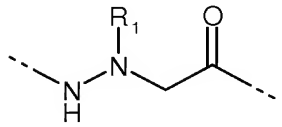
* the following formula (B) when it is situated in the C-terminal position,



(B)

or

* the following formula (C) when it is situated in the chain of the hybrid peptides,



(C)

wherein R_1 is identical to the side-chain of the initial amino acid of the peptide or of the parent protein to which the aza-β^3 aminoacyl monomers correspond,

- l, m, n, o and p represent zero, or a whole number lying between 1 and 20, provided that one at least of m or o is different from zero, that the minimum number of residues in the hybrid peptides of formula (I) is 4, and one at least of l, n, or p is different from zero.

39. (new) Hybrid peptides according to claim 37, of the following formulae:

- SEQ ID NO: 2 (or peptide E):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-Tyr-Gly-OH^{99}

- SEQ ID NO: 3 (or peptide C):

$^{88}H_2N$-Tyr-Ala-N -hLeu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 4 (or peptide A):

$^{88}H_2N$-Tyr-N -hAla-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 5 (or peptide B):

$^{88}H_2N$-Tyr-N -hAla-N -hLeu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 6 (or peptide D):

$^{88}H_2N$-Tyr-Ala-Leu-N -hLys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 7 (or peptide G):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-N -hTyr-Gly-OH^{99}

- SEQ ID NO: 8:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-N -hGly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 9:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-N -hArg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 10:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-N -hArg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 11:

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-N -hTyr-Gly-OH^{99}

- SEQ ID NO: 12 (or peptide F):

$^{88}H_2N$-N -hTyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-Gly-OH^{99}

- SEQ ID NO: 13 (or peptide H):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-Leu-Tyr-N -hGly-OH^{99}

- SEQ ID NO: 14 (or peptide I):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-N -hTyr-N -hGly-OH^{99}

- SEQ ID NO: 16 (or peptide A'):

$^{307}H_2N$-N -hPro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 17 (or peptide B'):

$^{307}H_2N$-Pro-N -hLys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 18 (or peptide C'):

$^{307}H_2N$-Pro-Lys-N -hTyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 19 (or peptide D'):

$^{307}H_2N$-Pro-Lys-Tyr-N -hVal-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 20 (or peptide E'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-N -hLys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 21 (or peptide F'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-N -hLeu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 22 (or peptide G'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-N -hLys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 23 (or peptide H'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-N -hAsn-Thr-Leu-Lys-Leu-Ala-Thr-OH^{319}

- SEQ ID NO: 24 (or peptide I'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-N -hLeu-Ala-Thr-OH^{319}

- SEQ ID NO: 25 (or peptide J'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-N -hAla-Thr-OH^{319}

- SEQ ID NO: 26 (or peptide K'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-N -hLys-N -hLeu-N -hAla-Thr-OH^{319}

- SEQ ID NO: 27 (or peptide L'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-N -hLeu-N -hAla-Thr-OH^{319}

40. (new) Hybrid peptides according to claim 37, of the following formulae:

- SEQ ID NO: 2 (or peptide E):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-Tyr-Gly-OH^{99}

- SEQ ID NO: 7 (or peptide G):

$^{88}H_2N$-Tyr-Ala-Leu-Lys-Arg-Gln-Gly-Arg-Thr-N -hLeu-N -hTyr-Gly-OH^{99}

- SEQ ID NO: 25 (or peptide J'):

$^{307}H_2N$-Pro-Lys-Tyr-Val-Lys-Gln-Asn-Thr-Leu-Lys-Leu-N -hAla-Thr-OH^{319}

41. (new) Polyclonal or monoclonal anti-hybrid peptide antibodies such as obtained by immunization of an animal with at least one hybrid peptide defined in claim 27, the antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent protein.

42. (new) Anti-idiotype antibodies capable of forming a complex with polyclonal or monoclonal anti-hybrid peptide antibodies such as obtained by immunization of an animal with at least one hybrid peptide defined in claim 27, the anti-hybrid peptide antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent,

such as obtained by immunization of an animal with the polyclonal or monoclonal anti-hybrid peptide antibodies.

43. (new) A complex between a hybrid peptide such as defined in claim 27, and an element of the major histocompatibility complex (also referred to as MHC-hybrid

complex), and possibly a T cell receptor (also referred to as MHC-hybrid-T receptor complex).

44. (new) A complex between a hybrid peptide such as defined in claim 27, and a T cell receptor.

45. (new) A method for the *in vitro* diagnosis of pathologies associated with the presence in the body of a patient, of an exogenous or endogenous protein, capable of being directly or indirectly involved in the process of appearance and/or development of these pathologies, characterized in that it comprises:

- contacting a biological sample deriving from a patient capable of being a carrier of antibodies directed against the protein, with a hybrid peptide such as defined in claim 27, the hybrid peptide being derived from all or part of the endogenous or exogenous protein, or derived from a peptide capable of being recognized by antibodies themselves recognizing the exogenous or endogenous protein,

under conditions allowing the reaction between the antibodies directed against the protein and capable of being present in the biological sample, and the hybrid peptide,

- the *in vitro* detection of the antigen / antibody complex capable of being formed in the preceding stage or

- the *in vitro* detection of antibodies circulating in the patient by a competitive test using an anti-hybrid antibody.

46. (new) A method for the *in vitro* diagnosis of pathologies associated with the presence in the body of a patient of an exogenous or endogenous protein capable of being directly or indirectly involved in the process of appearance or development of these pathologies, the method being characterized in that it comprises:

- contacting a biological sample deriving from a patient capable of being a carrier of the protein with at least one of the polyclonal or monoclonal anti-hybrid peptide antibodies, such as obtained by immunization of an animal with at least one hybrid peptide defined in claim 27, the antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent protein, said antibodies being advantageously directed against a hybrid peptide derived from all or part of the endogenous or exogenous protein, or

under conditions allowing the reaction between the protein capable of being present in the biological sample, and the antibodies directed against the hybrid peptide;

- the *in vitro* detection of the antigen / antibody complex capable of being formed in the preceding stage, or

- the detection of antigens circulating in the patient in competitive tests using a hybrid peptide as previously defined.

47. (new) A kit for the implementation of the *in vitro* diagnostic method according to claim 45, comprising:

- a hybrid peptide derived from all or part of the endogenous or exogenous protein, or corresponding to a peptide capable of being recognized by antibodies themselves recognizing the exogenous or endogenous protein,

- reagents to render a medium suitable for the formation of an immunological reaction,

- reagents making it possible to detect the antigen / antibody complex which has been formed as a result of the immunological reaction, the reagents possibly containing a

marker or being capable of being recognized in their turn by a labeled reagent, more particularly in the case where the hybrid peptide or the anti-hybrid antibodies are not labeled.

48. (new) A kit for the implementation of the *in vitro* diagnostic method according to claim 46, comprising:

- polyclonal or monoclonal anti-hybrid peptide antibodies, said antibodies being directed against a hybride peptide derived from all or part of the endogenous or exogenous protein,
- reagents to render a medium suitable for the formation of an immunological reaction,
- reagents making it possible to detect the antigen / antibody complex which has been formed as a result of the immunological reaction, the reagents possibly containing a marker or being capable of being recognized in their turn by a labeled reagent, more particularly in the case where the hybrid peptide or the anti-hybrid antibodies are not labeled.

49. (new) A pharmaceutical composition, in particular vaccine, characterized in that it comprises

a hybrid peptide as defined in claim 27, or

an anti-idiotype antibody capable of forming a complex with polyclonal or monoclonal anti-hybrid peptide antibodies such as obtained by immunization of an animal with at least one hybrid peptide as previously defined,

the anti-hybrid peptide antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent protein,

such as obtained by immunization of an animal with the polyclonal or monoclonal anti-hybrid peptide antibodies,

whether or not in combination with a physiologically acceptable vehicle.

50. (new) A pharmaceutical composition characterized in that it comprises

a hybrid peptide as defined in claim 27,

or an anti-idiotype antibody capable of forming a complex with polyclonal or monoclonal anti-hybrid peptide antibodies such as obtained by immunization of an animal with at least one hybrid peptide as previously defined,

the anti-hybrid peptide antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent protein,

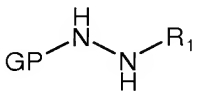
such as obtained by immunization of an animal with the polyclonal or monoclonal anti-hybrid peptide antibodies,

combined with a carrier molecule, whether or not proteic, capable of inducing *in vivo* the production of antibodies neutralizing the exogenous or endogenous protein responsible for the pathology, or inducing *in vivo* a cytotoxic or helper cellular immune response.

51. (new) A pharmaceutical composition, characterized in that it comprises polyclonal or monoclonal anti-hybrid peptide antibodies such as obtained by immunization of an animal with at least one hybrid peptide defined in claim 27, the antibodies being capable of forming a complex with these hybrid peptides, and/or with the peptides or parent proteins corresponding to these latter, and characterized in that they

recognize the parent peptide or the parent protein with an affinity at least equal to that displayed by the anti-parent peptide or anti-parent protein antibodies towards the parent peptide or the parent protein, in combination with a physiologically acceptable vehicle.

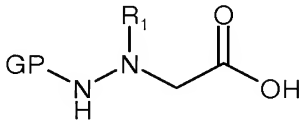
52. (new) A process for the preparation of aza-^{3} amino acids characterized in that it comprises a stage of treatment of the substituted and protected hydrazine of the following formula (D):

(D) 

wherein R_1 represents a side-chain selected from those of the amino acids, if necessary protected, and GP a protective group of amine functions, such as Boc, Fmoc, or Z,

with glyoxylic acid with stirring in the presence of $NaBH_3CN$ in an acidic medium,

which leads in one stage to the aza-β^3 amino acid compound of formula



wherein R_1 and GP are as defined above, and the compound can if necessary be deprotected, in particular by means of HCl, of piperidine, or of palladiated hydrogen, in order to remove the group GP and replace it with H.

53. (new) Aza-ß^{3} amino acids of the following formulae:

Fmoc aza-ß^{3}-Glycine (Fmoc-N hGly-OH),

Fmoc aza-ß^{3}-Lysine (Fmoc-N hLys(Boc)-OH),

Fmoc aza-ß^{3}-Aspartic acid (Fmoc-N hAsp(OtBu)-OH),

Fmoc aza-ß^{3}-Methionine (Fmoc-N hMet-OH),

Fmoc aza-ß^{3}-Arginine (Fmoc-N hArg (Boc)-OH),

Fmoc aza-ß^{3}-Tyrosine (Fmoc-N hTyr(OCH_2OEt)-OH),

Fmoc aza-ß^3-Asparagine (Fmoc-N hAsn (Trt)-OH),

Fmoc aza-ß^3-Proline (Fmoc-N hPro-OH).